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ABSTRACT

Grade-span configuration refers to the range of grades within a school. Grade span is an important issue to various factions in public education, including advocates of middle schools and rural educators concerned with the association between grade fragmentation and school consolidation. This digest focuses on research that has examined the relationship between grade span and student achievement. While many case studies of grade-span effects in particular schools exist, little research has been done using techniques to control for confounding factors. Five studies using such techniques are briefly described. These used data from 18 New York City schools, 700 rural Louisiana schools, 1,001 Texas schools, 163 rural Maine schools, and 330 Pennsylvania schools. In general, the studies suggest that achievement in the middle grades is higher in schools having an elementary-wide configuration than in those with a middle-grades configuration. In a K-8 configuration, absence of school-to-school transitions and greater continuity of experience may contribute to higher achievement. However, only one of the studies considered the instructional or interpersonal dimensions of school life. Further research is needed to disentangle the effects of grade span from those of its corollaries. (Contains 12 references.) (SV)

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The (Limited) Evidence Regarding Effects of Grade-Span Configurations on Academic Achievement: What Rural Educators Should Know

Theodore Coladarci and Julie Hancock

Grade span, or *grade configuration*, is the range of grades that a school comprises. For example, students in Bangor, Maine (where the first author's children attended school) begin their education career at a K-3 school, proceed to a 4-5 school, then a 6-8 school, and finally to the 9-12 high school. There are many alternatives to the Bangor profile, of course. Table 1 shows the configurations, involving selected grades, for public schools across the country. The sixth grade, for example, most often is found in a P/K-6 school (41.49%), although the 6-8 configuration is not uncommon (25.34%). Roughly half of eighth-grade schools are configured either 6-8 (35.23%) or P/K-8 (19.12%), with a sizable number evenly divided between 7-12 (11.67%) and 7-8 (11.66) configurations. Finally, a 12th grade typically is situated in a 9-12 school (66.48%), with 7-12 (16.46%) and P/K-12 (7.82%) accounting for the remaining schools having a 12th grade.

However configured, a school's grade span is an important issue to various factions concerned with public education. For example, many proponents of middle-level education favor the educational separation of young adolescents to best accommodate their developmental needs and characteristics (e.g., Jenkins & McEwin, 1992). According to such thought, a 5-8 or 6-8 configuration is more desirable than, say, a K-8 configuration. Rural educators, in contrast, sometimes decry such grade fragmentation because of its association with school consolidation, school closures, and the threatened survival of rural communities (e.g., DeYoung, Howley, & Theobald, 1995). Finally, budget-minded school board members and legislators typically raise a basic cost-benefit question: For a fixed allocation of dollars, which configuration of grades is likely to produce the best academic results?

Our focus is on the relationship between grade span and *academic achievement*. To be sure, there are other considerations that influence decisions regarding the configuration of grades in a school or district, such as those related to fiscal constraints, political tensions, or geographical realities. We do not mean to impugn their importance by not addressing these considerations here. But what ultimately matters—or should matter—to educators, policymakers, business persons, and the general public is how much students learn. This is particularly true in the present era of educational reform in which student performance on standards-aligned achievement assessments has become the veritable bottom line. So, what *is* known about the effects of grade span on academic achievement?

Existing Research

Unfortunately, research bearing on this general question is limited. Many accounts of grade-span effects are, in fact, descriptive cases of a particular school that changed its grade configuration for one reason or another. The "Northwest Sampler" compiled by Paglin and Fager (1997) is an engaging example of such accounts. But as provocative as case studies may be, they are not designed to suggest the causal *effects* of something (like grade span). More technical methods are required, such as statistical procedures that attempt to take into account, or control for, important confounding factors. However, only a few grade-span researchers have employed such methods (Calhoun, 1983) and it is their studies that we now turn.

In his study of 18 schools in New York City, Moore (1984) found that both seventh- and eighth-grade reading achievement was higher for students in K-8 schools than in schools having a 6-8 configuration. The K-8 and 6-8 schools were similar in terms of ethnicity and socioeconomic status. Further, Moore statistically controlled for the sixth-grade achievement of these students. This means that the achievement disadvantage associated with 6-8 schools was not due to a pre-existing achievement deficit. Better attendance, more positive attitudes toward school, and higher self-esteem also were reported for seventh and eighth graders in K-8 schools.

Although based on urban schools, Moore's findings are consistent with those reported by Franklin and Glascock (1998) in their study of more than 700 rural schools in Louisiana. These researchers found that sixth and seventh graders in K-6, K-7, and K-12 schools performed significantly higher on the state achievement test than students in 6-8 and 7-9 schools. Further, students in the 10th grade had significantly higher test scores, and fewer behavior problems, in K-12 schools than in 7-12, 8-12, or 9-12 schools. The statistical analysis took into account school size and community socioeconomic status.

Bickel, Howley, Williams, and Glascock (2001) examined 10th-grade Texas Assessment of Academic Skills (TAAS) scores for 1,001 Texas schools. Equipped with a cornucopia of control variables (e.g., demographics, school size, expenditures), Bickel et al. reported a slight but statistically significant advantage for K-12 schools when compared to all other configurations containing the 10th grade.

Table 1. Number of U.S. Regular Public Schools by Grade Span, for selected grades (1999-2000)

Schools with Grade 6			Schools with Grade 8			Schools with Grade 12		
grade span	%	n	grade span	%	n	grade span	%	n
P/K-6	41.49	13,721	6-8	35.23	8,381	9-12	66.48	11,216
6-8	25.34	8,381	P/K-8	19.12	4,551	7-12	16.46	2,776
P/K-8	13.76	4,551	7-12	11.67	2,776	P/K-12	7.82	1,319
5-8	4.12	1,363	7-8	11.66	2,773	other	9.24	1,559
other	15.29	5,058	5-8	5.73	1,363	total	100.00	16,870
total	100.00	33,074	other	16.59	3,948			
			total	100.00	23,792			

Note: "P/K" denotes a grade span that begins with either pre-kindergarten or kindergarten.

Source: U.S. Department of Education, National Center for Education Statistics Common Core of Data (CCD), School Survey, 1999-2000. Table constructed by authors based on information compiled 4-25-02 by Mark Kolanowski, National Center for Education Statistics (Request 944220).

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This difference held for reading, writing, and mathematics alike.

With a sample of 163 Maine schools (arguably one of the more rural states in this country), Wihry, Coladarci, and Meadow (1992) examined the influence of grade span on eighth-grade student performance on the state achievement test. Statistically controlling for school-level socioeconomic status, per-capita income in the community, and parent educational attainment, Wihry et al. found that eighth-grade total achievement was significantly higher in K-8, K-9, and 3-8 schools than in schools configured around the middle grades (4-8, 5-8, 6-8) or those having a junior/senior high school configuration (6-12, 7-12, 8-12).

In a study of sixth-grade achievement in 330 Pennsylvanian schools, Becker (1987) found that the grade-span effect on academic achievement depended on the students' socioeconomic status. That is, although there was an overall achievement advantage to locating sixth graders in an elementary versus a middle school configuration, the advantage was most evident among students low in socioeconomic status. This "interaction" between grade-span configuration and socioeconomic status prevailed across content areas (mathematics, reading, science, and social studies), and it held after Becker controlled for such factors as instructional practices, tracking and ability grouping, and enrollment per grade.

Discussion

Their convergence notwithstanding, these results should be treated with considerable caution. Although the studies above were generally well designed, they nonetheless are few in number. Further, achievement effects have been examined mostly at the middle-level grades. And although these researchers attempted to take into account important confounding influences (e.g., socioeconomic status), there doubtless are other factors that, if considered, would change the results—perhaps markedly. Although a tiresome refrain, more research clearly is needed!

That said, the consistency of grade-span results is noteworthy and generally suggest that achievement in the middle grades is higher in schools having an elementary-wide configuration than a middle-grades configuration. If these results stand up to subsequent research, then the important question is, "Why?" We believe that the answer, in part, may lie in the continuity of experience that wider grade spans afford.

When students make the transition from one school to the next, they experience the usual novelties associated with any advancement to the next grade, such as a more challenging curriculum. But there are other changes as well: a new building, unfamiliar teachers and administrators, different expectations for student conduct, new constellations of classmates, and so on. While there is not an abundance of research on this topic, the evidence suggests that transition effects are largely negative. For example, Simmons and Blyth (1987) reported a decline in performance, motivation, and self-esteem following a transition from one school to another. Similar results have been obtained by others (NMSA Research Summary #8).

In a K-8 configuration, absence of school-to-school transitions and greater continuity of experience arguably may be behind the higher achievement that has been reported for middle-grade students attending such schools. And it perhaps is responsible for the better attendance, more positive attitudes toward school, and higher self-esteem that Moore (1984) reported for these students. A similar argument would explain why a sixth grader would be advantaged in a K-6 school versus a 6-8 school. But these are mere conjectures on our part, and they are subject to confirmation or refutation by future research.

Implications

What, then, is a school system to do? The available research cannot answer this question with any degree of certainty, but the pattern of findings raises two important caveats. First, the segregation of adolescents in middle-grade schools does not necessarily translate into higher achievement. Indeed, the available evidence suggests just the opposite. With one exception (Becker, 1987), however, the research we summarized did not take into consideration the instructional or interpersonal dimensions of school life. Once grade-span researchers devote more attention to these matters, we suspect that a school's configuration of grades will be less important than the results above may suggest, at least in terms of academic achievement. In this sense, we are sympathetic to the position of the National Middle School Association: "Effective programs and practices, not grade configuration, determine the quality of schools" (NMSA Research Summary #1).

Second, where grade fragmentation is a reality, steps should be taken to lessen the adverse effects on students of school-to-school transitions. We agree with Paglin and Fager (1997, p. 9) that a school system with multiple grade spans should have in place "articulation and transition activities" among its units. Teachers and students alike should have an informed view of the instructional and social world of the next school in line. This, too, is an important direction for future research. Is the adverse grade-span effect on academic achievement softened in multi-unit systems having articulation and transition activities compared to multi-unit systems that do not? Is the positive grade-span effect in K-8 schools diminished where there is little dialogue among teachers across grade levels?

One should not infer from our closing caveats that grade configuration ultimately may not matter—that this structural feature of schools *in and of itself* may not affect academic outcomes. Rather, our point simply is that researchers must continue to disentangle grade span from its corollaries. The configuration of grades, in and of itself, probably *does* matter. The challenge for us is to become smarter about *why*.

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